International Standard

ISO 19044

Test methods for fibre-reinforced cementitious composites — Load-displacement curve using notched specimen

Méthodes d'essai des composites à base de ciment renforcés par des fibres — Courbe de déplacement de charge utilisant un échantillon entaillé

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Foreword

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This document was prepared by Technical Committee is ISO/TC 71, *Concrete, reinforced concrete and pre-stressed concrete*, Subcommittee SC 6, *Non-traditional reinforcing materials for concrete structures*.

This second edition cancels and replaces the first edition (ISO 19044:2016), which has been technically revised.

The main changes are as follows:

— in Clause 2, the normative reference has been updated;

— in Clause 4, the list of symbols has been updated;

— the legend for Figure 1 has been edited;

— A.7 has been updated.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Test methods for fibre-reinforced cementitious composites — Load-displacement curve using notched specimen

1 Scope

This document specifies the test method for the load-displacement curves of fibre-reinforced cementitious composites (FRCC) by three-point loading of notched prisms. The main purpose of this test is to evaluate the tension softening curve of FRCC.

NOTE 1 Both crack mouth opening displacement (CMOD) and load point displacement (LPD) are specified as the displacement in load-displacement curves, but measurement of both might not be necessary. Either can be selected depending on the purpose of measurement.

NOTE 2 Three-point bending test using notched specimen generally provides higher results than those observed in four-point bending test, in which the fracture occurs at the weakest point of the specimen.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 1920-3:2019, *Testing of concrete — Part 3: Making and curing test specimens*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at http://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
fibre-reinforced cementitious composite
FRCC
concrete or mortar containing short discrete fibres that are distributed in matrix

Note 1 to entry: Fibres include chemical fibres (metallic fibres, inorganic fibres, synthetic fibres, and so on) and natural fibres.

3.2
ligament
area above the notch subject to fracture

3.3
notch
cut for the initiation of fracture

4 Symbols

Symbol	Unit	Description	Reference
a_0	mm	depth of notch	5.1
b	mm	width of ligament	5.1
D	mm	depth of cross section of specimen	5.1
h	mm	height of ligament	5.1
L	mm	overall length of specimen	5.1
n_0	mm	width of notch	5.1
S	mm	loading span	5.1
t_k	mm	thickness of knife-edge	6.4

5 Test specimen

5.1 Geometry

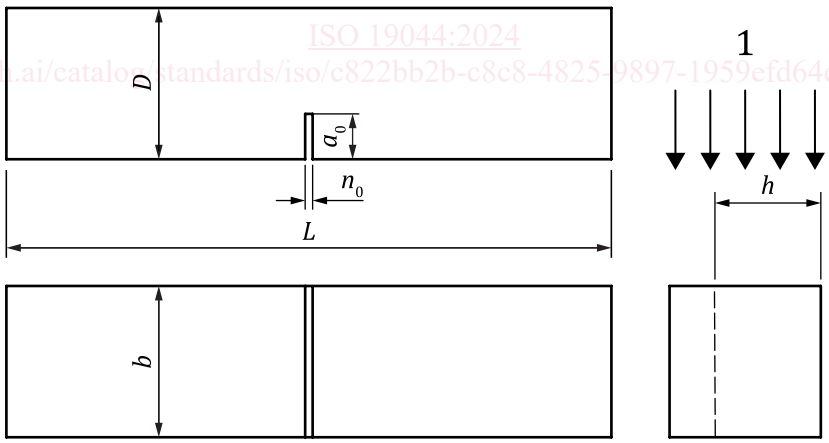
Specimens shall be prisms of square cross section with a notch at the mid-length as shown in Figure 1.

a) The cross sectional size of the specimen shall be fixed with two types for the ease of operating as follows: 150 mm × 150 mm and 100 mm × 100 mm. The side length of the cross section of the specimen shall be equal to or larger than three times the fibre length.

The specimens with different dimensions provide different test results even if the same FRCC is used. These test results should not be compared.

b) The overall length of the specimen (L) shall not be less than 3,5 D.

c) The notch depth (a_0) and notch width (n_0) shall be 0,3 D and not more than 5 mm, respectively.



Key

1 The arrows show the direction of casting.

Figure 1 — Specimen

5.2 Fabrication of specimen

a) The maximum aggregate size shall not be larger than 1/4 of the side length of the cross section of the specimen.